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EXAMINER	
SELBY, GEVELL V	
ART UNIT	**PAPER NUMBER**
2615	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/628,283	KAKIUCHI ET AL.	
	Examiner	Art Unit	
	Gevell Selby	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-30 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-30 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4,7.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claim 1, the limitation of "a second light source as claimed is misleading and not substantiated. The specification describes a light source, light emitting device 14, that radiates a laser beam, which is a distance measuring light beam or a data transferring light beam (page 13, line 20 to page 14, line 1), but fails to mention a second light source as a part of the camera that transfers data to an external device.

In regard to claim 2, a second light source "identical" to the first light source as claimed is also misleading ands not substantiated. Using the terms "first", "identical", and "second" suggests that there are two light sources that are exactly equal and alike, yet the specification describes one light source that performs the functions claimed of each light source.

For further examination purposes, the "second light source" will be replaced with "a second light beam" that originates from the first light source at a different path than the path impinging on the subject. The term "identical" in claim 2 will be interpreted as identical in origin.

3. Claim 27 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regard to claim 27, the claim states, "the accumulation of said signal charge" starts when said transmitting light beams falls, but it is vague and indefinite in what is means by "falls". The claim does not point out how the beam falls, whether the signal charge starts when the beam literally begins to lower or if it is meant that the transmitting light beam signal lowers. For examination purposes, it will be assumed that the transmitting light beam signal falls or moves to the inactive state.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 – 7, 29, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie (1995), in view of Helms et al., JP 09-149315.

Christie (1995), discloses a three-dimensional image capturing device, comprising:

a first light source that radiates a light beam (see figure 1, laser);

an image device that accumulates signal charge corresponding to a quantity of light received on said image device (see figure 1, CCD camera);

a distance information sensing processor (see figure 4, pulse control system) that radiates a distance measuring light beam from said first light source to a measurement subject and detects distance information which relates to said measurement subject by receiving a reflected light beam from said measurement subject due to said distance measuring light beam on said image device (see page 1303, last paragraph to page 1304, first paragraph); but lacks

a data transmitting processor that controls radiation at a second light ~~source~~ (beam) and radiates transmitting light beams, so that data is transmitted to an external device through space.

Wakui, JP 09-149315, discloses a camera light a light source that emits light beams for distance measuring as well as light beams to transmit data (see paragraphs 6 and 7).

It would have been obvious to a person skilled in the art at the time of invention to have been motivated to modify Christie (1995) in view of Wakui, JP 09-149315, to have a data transmitting processor that controls radiation at a second light ~~source~~ (beam) and radiates transmitting light beams, in order to have one component that achieves both distance measuring and communication with a external device while satisfying requirements of miniaturization and low cost (see Wakui: Abstract).

In regard to claim 2, Christie (1995) in view of Wakui, JP 09-149315, as explained above, discloses a device according to claim 1, wherein the distance measuring light beam and the data transferring light beam originate from the same source (Wakui: abstract, solution).

In regard to claim 3, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 1, wherein pulse frequency-modulation bands of said distance measuring light beam (see Christie: pg. 1301, last paragraph to pg. 1302, first paragraph) and said transmitting light beam are different from each other (see Wakui: paragraph 4).

It is implied that the first light beam for distance measuring has a different frequency modulation than the second light beam used to transmit data because the second light source followings the IrDA specification.

In regard to claim 4, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 1, wherein said data comprises said distance information (see Wakui: abstract, solution).

In regard to claim 5, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 1, comprising an image sensing processor that detects image information of said measurement subject by forming an image of said measurement subject on said image device (see Christie: pg. 1302, column 1).

In regard to claim 6, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 5, wherein said data comprises said image information (see Wakui: paragraph 16).

In regard to claim 7, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 1, comprising a switching

processor that switches on and off the drive of said data transmitting processor (see Wakui: paragraph 35).

In regard to claim 29, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a receiver for use in an optical transmission system (see Wakui paragraph 16), a transmitter of which comprises a three-dimensional image capturing device (see Wakui: figure 1), comprising:

a first light source that radiates a light beam (see figure 1, laser);

an image device that accumulates signal charge corresponding to a quantity of light received on said image device (see figure 1, CCD camera);

a distance information sensing processor (see figure 4, pulse control system) that radiates a distance measuring light beam from said first light source to a measurement subject and detects distance information which relates to said measurement subject by receiving a reflected light beam from said measurement subject due to said distance measuring light beam on said image device (see page 1303, last paragraph to page 1304, first paragraph); and

a data transmitting processor that controls radiation at a second light ~~source~~ (beam) and radiates transmitting light beams, so that data is transmitted to said receiver of an external device through space, wherein said external device starts a receiving operation of said data when said receiver receives said distance measuring light beam (see Wakui: paragraph 18).

In regard to claim 30, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a receiver according to claim 29, wherein said second light source is identical to said first light source (see Wakui: Abstract: Solution).

3. Claims 8 – 24, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874.

In regard to claim 8, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, discloses a device according to claim 2, but lacks wherein a series of said distance measuring light beams and a series of said transmitting light beams are superposed.

Helms et al., US 6,344,874, discloses an imaging system using a data transmitting light source for subject illumination with a controller for controlling the light emitter to transmit image data to the remote system at the same time as an image is being captured by the image sensor of the camera (see Helms: column 2, lines 38-41). In order to transmit data the light source flashes the light beam in a predefined pattern according to the IrDA standard (see column 3, lines 55-60) and to illuminate the image properly for image capture a second light beam considered as false data by a receiver is sent between data transfers see column 3, line 65 to column 4, lines 6).

It would have been obvious to a person skilled in the art at the time of invention to have been motivated to modify Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, in further view of Helms et al., US 6,344,874, to have series of said distance measuring light beams and a series of said transmitting light beams are

superposed are alternating in order to transmit data while taking a performing image capture as taught by Helms.

In regard to claim 9, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 8 , wherein said distance information sensing processor radiates said distance measuring light beams from said first light source a predetermined number of times, so that signal charge is accumulated in said image device due to each reiterated radiation (see page 1304, first paragraph).

In regard to claim 10, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 9, wherein timing for radiating said transmitting light beams is based upon the timing of said reiterated radiation of said distance measuring light beams (see Helms: column 5, lines 12-15).

Since the distance measuring light beams reiterations determine the exposure time, it is implied that timing for the transmitting light beams is based on the distance light beams.

In regard to claim 11, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 10, wherein said series of said distance measuring light beams and said series of said transmitting light beams are superposed, so that said transmitting light beams are radiated in the intervals between said distance measuring light beams (see Helms: column 5, lines 12-15).

In regard to claim 12, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 11, wherein said transmitting light beams comprise a pulse beam representing binary data in predetermined digits (see Wakui: paragraph 4 and 21).

In regard to claim 13, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 10, wherein said distance measuring light beams and said transmitting light beams are superposed by pulse-width modulation of said light beams, so that said light beams comprise two types of pulse beams having different widths, which represent binary data of said data and are used for detecting said distance information, concurrently (see Helms: column 2, lines 42-47 and column 3, line 65 to column 4, line 5).

The distance measuring light beams and transmitting light beams can be superposed with the distance measuring light beams providing "false data", data with a pulse width different from a recognized digit in the IrDA standard, so that only the binary data sent by the transmitting light beams are read by the receiver.

In regard to claim 14, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 9, wherein said distance measuring light beam is radiated before an accumulation of signal charge in said image device starts, and signal charge corresponding to said distance information of said measurement subject is accumulated during a period from a beginning of said accumulation to an end of said reflected light beam reception at said image device (see Wakui: pg. 1304, first paragraph).

In regard to claim 15, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 14, wherein said transmitting light beam is radiated prior to said distance measuring light beam (see Helms: column 4, lines 12-15 and 41-53).

Distance measuring is part of image capture for in the Christie reference. It is implied that, before the next image capture, the previous image data is transferred in when the operations are done sequentially.

In regard to claim 16, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 15, wherein said transmitting light beam is radiated during a period, from an end of said accumulation of said signal charge in said image device to a beginning of said distance measuring light beam radiation (see Helms: column 4, lines 12-15 and 41-53)

Distance measuring is part of image capture in the Christie reference. It is implied that the data transfer is done from the end of the last image capture until the distance measuring to start the next image capture when the operations are done sequentially.

In regard to claim 17, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 8 , wherein said distance measuring light beams comprise a synchronizing signal of an optical transmission system (see Helms: column 4, lines 12-15 and 41-53).

Distance measuring is part of image capture in the Christie reference. It is implied that the distance measuring light beams are synchronized with the transmission beams in order to transmit sequentially and therefore have a synchronizing signal.

In regard to claim 18, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 2, wherein an accumulation of said signal charge in said image device is synchronously carried out with said transmitting light beam, so that said transmitting light beam can be used as said distance measuring light beam as well, and by this, said transmitting light beams and said distance measuring light beams are superposed with each other (see Helms: column 4, lines 12-15 and 41-53; Distance measuring is part of image capture in the Christie reference.).

In regard to claim 19, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 18, wherein said distance information sensing processor radiates said distance measuring light beams from said first light source a predetermined number of times, so that signal charge is accumulated in said image device due to each reiterated radiation (see Wakui: pg. 1304, first paragraph).

In regard to claim 20, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 18, wherein a series of said transmitting light beams represents binary data (see Wakui: paragraph 4 and 21).

In regard to claim 21, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 18, wherein said transmitting light beams comprise pulse modulated laser beams (see Wakui: pg. 1304, first paragraph and Helms: column 2, lines 38-41)

In regard to claim 22, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 21, wherein a data sequence transmitted by said transmitting light beams comprises a partition signal that delimits said data sequence by predetermined binary digits of the data (see Wakui: paragraph 4 and 21).

In regard to claim 23, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 18, wherein said image device comprises a plurality of photoelectric conversion elements that accumulates signal charge corresponding to a quantity of light received, and signal charge holding units disposed adjacent to each of said photoelectric conversion elements (see Wakui: pg. 1304, first paragraph).

In regard to claim 24, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 23, wherein the accumulation of said signal charge in said image device begins with a fall of an electric charge discharging signal that discharges the charge accumulated in said photoelectric conversion elements, and ends with a fall of an electric charge transfer signal that transfers said signal charge accumulated in said

photoelectric conversion elements to said signal charge holding units (see Wakui: pg. 1301, column 2, paragraph 2).

It is implied that a control signal starts the accumulation of signal charge in the image sensor and another control signal stops the accumulation and transfers the signal charge to the distance measuring unit in order to measure the distance of the object. Whether the signals both are activate high or active low is irrelevant because both ways produce the same function.

In regard to claim 27, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 18, wherein the accumulation of said signal charge starts when said transmitting light beam (signal) falls (see Helms: column 4, lines 42-49).

It is implied by the Helms reference that when the control signal to the transmitting light beam signal falls or becomes inactive the image capture starts because they occur in sequence and image capture in the Christie reference begins with distance measuring.

In regard to claim 28, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 19, wherein said distance information sensing processor and said data transmitting processor are actuated during a distance measuring period, in which said distance measuring light beams are repeatedly radiated said predetermined number of times (see Christie: pg 1304, first paragraph), said distance measuring period comprising:

a data transmitting period, in which said distance measuring light beams and said transmitting light beams are superposed and radiated (see Helms: column 2, lines 38-41; The distance measuring is part of image capture in the Christie reference.); and

a supplement light emitting period, in which distance measuring light beams are radiated so as to supplement the number of said distance measuring light beams radiated in said data transmitting period, by the number deficient from said predetermined number of times (see Christie: pg. 1304, first paragraph).

It is implied by the Christie reference that the laser will continue to radiate until the same amount of light is radiated each time a distance measurement is taken in order to have the same pulse train for each frame.

4. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874,as applied to claim 8, and further in view of Takemura, US 4,831,453.

In regard to claim 25, Wakai et al., US 5,448,360, in view of Helms et al., US 6,344,874, as applied to claim1 above, and further in view of Wakui, JP 09-149315, discloses a device according to claim 24, but lacks wherein said electric charge transfer signal rises approximately simultaneously with the fall of said electric charge discharging signal.

Takemura, US 4,831,453, discloses an image sensing device with a high speed transfer section wherein said electric charge transfer signal (Figure 7A, element I) is

generated by conjunction of a standard electric charge transfer signal comprised of periodic pulse signals (see figure 7B, element P_1 and P_2) and a data synchronizing pulse signal (see figure 6, element H1 or H2) generated synchronously with the fall of a pulse signal of said data sequence;

said electric charge discharging signal (See figure 7C, element S) is generated by conjunction of said data synchronizing pulse signal (see figure 6, element H1 or H2) and a standard electric charge discharging signal (see figure 7B, element Ps) a period of which is the same as said standard electric charge transfer signal (see figure 7B, element P2) and from which the phase is delayed by a half period; and

said data synchronizing pulse signal is synchronized with said standard electric charge discharging signal (synchronized with reset signal RS) and the pulse width of said data synchronizing pulse signal (see figure 6, element H1 or H2) is the same as one period of said standard electric charge transfer signal (See figure 6D, signal output period).

It would have been obvious to a person skilled in the art to modify Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874,as applied to claim 8, and further in view of Takemura, US 4,831,453, to have a high speed transfer section so that one-frame images of excellent vertical resolution can be obtained, which are free from flicker even when the object being imaged is in rapid motion as taught by Takemura. Therefore the device has the electric charge transfer signal rising approximately simultaneously with the fall of said electric charge discharging signal

In regard to claim 26, Christie (1995) in view of Wakui, JP 09-149315, as applied to claim 1 above, and further in view of Helms et al., US 6,344,874,as applied to claim 8, and further in view of Takemura, US 4,831,453, discloses the device of claim 25.

Takemura, US 4,831,453, discloses wherein said electric charge transfer signal (Figure 7A, element I) is generated by conjunction of a standard electric charge transfer signal comprised of periodic pulse signals (see figure 7B, element P_1 and P_2) and a data synchronizing pulse signal (see figure 6, element H1 or H2) generated synchronously with the fall of a pulse signal of said data sequence;

said electric charge discharging signal (See figure 7C, element S) is generated by conjunction of said data synchronizing pulse signal (see figure 6, element H1 or H2) and a standard electric charge discharging signal (see figure 7B, element Ps) a period of which is the same as said standard electric charge transfer signal (see figure 7B, element P2) and from which the phase is delayed by a half period; and

said data synchronizing pulse signal is synchronized with said standard electric charge discharging signal (synchronized with reset signal RS) and the pulse width of said data synchronizing pulse signal (see figure 6, element H1 or H2) is the same as one period of said standard electric charge transfer signal (See figure 6D, signal output period).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following art discloses three dimensional image capturing devices:

5,005,085, 6,088,106

6,023,292, 5,648,817,

5,148,211, 5,995,233,

The following disclose cameras with communication devices:

6,642,959, 5,634,144.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, Vu Le can be reached on 703-308-6613. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs

VU LE
PRIMARY EXAMINER